

1560.17d1 claims proposed claims

33. A road speed surface maintenance machine with vacuumized dust control, comprising:

- a. a transportable machine chassis having a front axle and at least one rear axle;
- b. a source of vacuum;
- c. a main road surface cleaning head in fluid communication with the vacuum source, and having an opening adapted to be adjacent a surface intended to be cleaned, the main road surface cleaning head suspended from the transportable machine chassis and adapted to be located outside of the space between said axles;
- d. a hopper coupled to the transportable machine chassis for collecting dust, dirt, and debris;
- e. an inclined conveying mechanism having a housing and the housing having a first open end in communication with the road surface cleaning head, and a second end in communication with the hopper,
- f. at least a portion of the conveyor being in fluid communication with the vacuum source to urge the dust and debris upwardly along said conveyor, the conveying mechanism adapted for transporting to the hopper any dust, dirt, and debris from the main road surface cleaning head; and
- g. an air filtration mechanism for substantially removing any airborne dust in air drawn from the main road surface cleaning head before being exhausted to the outside environment.

34. The road sweeper of claim 1, wherein the main road surface cleaning head includes a rotary broom pivotally mounted

rearward of said rear axle to allow maximal vertical movement thereof without impinging on said chassis.

35. The road sweeper of claim 34, wherein said conveyor is inclined and extends, at least in part, past said chassis to said broom so that the chassis can be built to accommodate predefined limited height clearance requirements.

36. The road sweeper of claim 33, wherein the sweeper is capable of achieving and maintaining ordinary vehicle road speed while the rotary cleaning head, fan and conveyor operate simultaneously.

37. The road sweeper of claim 33, wherein the vacuum source includes a vacuum fan in communication with the outside environment for establishing an airflow from the main road surface cleaning head, through the conveying mechanism housing, entering the hopper, and exhausting from the hopper out to the outside environment, thereby vacuumizing, at least in part, the main road surface cleaning head, the conveying mechanism housing, and the hopper.

38. The road sweeper of claim 33, wherein the main road surface cleaning head includes an elongated rotary broom have a rotational axis generally aligned with the surface intended to be cleaned.

39. The road sweeper of claim 33, further including at least a first gutter cleaning head in fluid communication with the vacuum source, and having an opening adjacent a gutter area intended to be cleaned.

40. The road sweeper of claim 33, wherein the air filtration mechanism includes a dust filter assembly in the path of air entering the hopper and exhausting out to the outside environment so that any airborne dust within the hopper is substantially blocked from exhausting out to the outside environment.

41. The road sweeper of claim 33, wherein the main road surface cleaning head is suspended from the transportable machine

chassis and controllably positioned so that the elongated rotary broom is capable of making contact with the road surface intended to be cleaned.

42. The sweeper of claim 41, wherein the cleaning head is attached to the chassis by support arms and further includes at least one actuating cylinder capable of adjusting the elevation of the broom, said cylinder being attached to a cable located between the pivotal broom support arms and the chassis.

43. A road speed broom sweeper with vacuumized dust control, comprising:
- a. a transportable machine chassis having a front axle and at least one rear axle;
  - b. a vacuum source coupled to the transportable machine chassis;
  - c. a rotary broom controllably suspended from the transportable machine chassis rearward of the at least one rear axle and controllably positioned so as to be capable of making contact with a road surface intended to be swept;
  - d. a rotary broom shroud forming a rotary broom chamber in fluid communication with the vacuum source capable of being vacuumized, the rotary broom shroud being located around and about the rotary broom and being removable in part for servicing;
  - e. a hopper for collecting dust, dirt, and debris;
  - f. a conveyor mechanism having a housing at least a portion of the conveyor being in fluid communication with the vacuum source, and the housing having a first open end in communication with the rotary broom chamber, and a second end in communication with the hopper, the conveyor mechanism adapted for transporting to the hopper any dust, dirt, and debris thrown from the rotary broom; and,
  - g. an air filtration mechanism in the path of the air entering the hopper and exhausting out to the outside environment for substantially removing any airborne dust in air drawn from the rotary broom chamber before being exhausted to the outside environment.

43. The road sweeper of claim 42, wherein air filtration mechanism includes a vacuum fan in communication with the outside environment for establishing an airflow from the rotary broom chamber, through the conveyor mechanism housing, entering the hopper, and exhausting from the hopper out to the

outside environment, thereby vacuumizing, at least in part, the rotary broom chamber, the conveyor mechanism housing, and the hopper.

44. A street sweeper, comprising:
- a. transport means;
  - b. a hopper carried by the transport means;
  - c. means for rotary sweeping, the means for rotary sweeping carried by the transport means and capable of dislodging debris and dust from a road surface said means being located at the rear of said transport means;
  - d. means for conveying debris from the means for rotary sweeping to the hopper, said means being inclined and extending upwardly from said sweeping means;
  - e. means for generating a vacuuming airflow from the means for rotary sweeping to the hopper along said transport means so as to entrain dust dislodged by the means for rotary sweeping; and,
  - f. means for separating entrained dust from the airflow from the means for rotary sweeping at the hopper.

- 45. The street sweeper of claim 44, further comprising:
  - a. means for gutter sweeping to dislodge dust and debris from a road gutter; and,
  - b. means for entraining dislodged dust from the means for gutter sweeping to the hopper.
- 46. The street sweeper of claim 45, wherein the means for separating entrained dust from the airflow from the means for rotary sweeping also functions as a means for separating entrained dust from the means for gutter sweeping.
- 47. The street sweeper of claim 45, wherein the airflow from the means for rotary sweeping passes within a conveyor housing having a first cross sectional area and further wherein the means for separating includes increasing the cross sectional area of the airflow within the hopper relative to the airflow within the conveyor housing, thereby effecting a reduction of airflow velocity.
- 48. A street sweeper with vacuumized dust control, comprising:
  - a. a truck means, the truck means having a chassis, the chassis having a front axle and at least one rear axle;
  - b. a superstructure framework means, the superstructure framework means being mounted on the chassis, the superstructure framework means including a plurality of framework members and having a pair of pivotal broom support arms, the pivotal broom support arms being directed generally rearward;
  - c. a rotary broom means, the rotary broom means having opposing ends supported by the pair of pivotal broom support arms such that the rotary broom means is located rearward of the at least one rear axle, the rotary broom means being rotatable to sweep a road surface traveled by the truck means by sweeping counter to the direction of travel;

- d. a rotary broom chamber means, the vacuumized chamber means being located around and about the rotary broom means and in close proximity to the road surface, the rotary broom chamber means containing dust which becomes airborne during sweeping of the road surface by the rotary broom means;
- e. a hopper means attached to the chassis, the hopper means being to the chassis attached via a scissors jack mounting frame and a scissors jack assembly, the hopper means being capable of storing dust and debris, the hopper means having a fan associated therewith, the fan causing airflow from the rotary broom chamber means to the hopper mean and then through a filter and thereby passing out of the hopper means, while airborne dust remains in the hopper means, the airborne dust being substantially blocked from passing by the filter; and,
- f. an inclined conveyor housing means, the conveyor housing means communicating between the rotary broom chamber means and the hopper means, the conveyor housing means having a conveyor extending therethrough, the conveyor having a cleated belt which operates in a continuous loop and carries debris from the rotary broom means to the hopper means and simultaneously conducts the airflow and airborne dust from the rotary broom chamber means through the conveyor housing means to the hopper means.

49. A method of cleaning a road surface while controlling dust, comprising the steps of:

- a. providing a rotary broom on a truck rearward of the rear axle of the truck, the truck carrying a hopper and including vacuum induced airflow from the rotary broom to the hopper and a debris conveyor from the rotary broom to the hopper;
- b. rotating the rotary broom against the road surface while moving the truck in a forward direction such that the action of the rotary broom is counter to the forward direction;
- b. conveying dislodged debris on an inclined from the rotary broom to the hopper;
- c. maintaining a flow of vacuumized airflow along at least a port of the conveyor as it conveys debris toward the hopper; and
- d. entraining airborne dust in the induced airflow from the rotary broom to the hopper.

51. The method of claim 49, wherein the truck further includes a gutter broom mounted forward of the rotary broom and induced airflow from the rotary broom to the hopper, and further comprising the steps of:

- a. rotating the gutter broom against a gutter while moving the truck in a forward direction such that the action of the gutter broom is counter to the forward direction;
- b. entraining airborne dust in the induced airflow from the gutter broom to the hopper; and,
- c. sweeping dislodged debris from the gutter to a position in front of the rotary broom.



50. The method of claim 49, further comprising the step of separating entrained airborne dust from the induced airflow within the hopper.